MANAGEMENT DIRECTION STATEMENT

March 2003

for Pavilion Lake
Marble Canyon Park

BRITISH COLUMBIA
Ministry of Water, Land and Air Protection
Environmental Stewardship Division

105-05487/

PAVILION LAKE

MANAGEMENT DIRECTION STATEMENT

March 2003

Approved by:

Monty Downs
Regional Manager, Thompson Region
Environmental Stewardship Division

Date: 03/03/29

Nancy Wilkin
Assistant Deputy Minister
Environmental Stewardship Division

Date: 03/03/31

Table of Contents

Introduction
Purpose of the Management Direction Statement 2
Context 2

Protected Area Attributes
Conservation 2
Recreation and Tourism 4
Cultural Heritage 4
Significance in the Protected Areas System 5

Land Uses, Tenures and Interests
Access 5
Tenures 5
Existing Land Use Activities and Facilities 5
Adjacent Patterns of Land Use 5
First Nations Interests 6
Other Agency Interests 6
Private and Public Stakeholder Interests 6

Protected Area Role Statement 6

Management Commitments and Issues
Management Direction from Previous Planning 7
Management Issues 7

Management Direction
Priority Management Objectives and Strategies 8
Consultation and Future Planning 10
Zoning Plan 10

Figures
Context 3
Protected Area Zoning 12

Appendix 1
Table of Acceptable Activities, Uses and Facilities - Pavilion Lake 13

PAVILION LAKE – MARBLE CANYON PARK
MANAGEMENT DIRECTION STATEMENT

Introduction

Purpose of the Management Direction Statement

This management direction statement (MDS) provides strategic management direction specifically for the recently added Pavilion Lake portion of Marble Canyon Park. It is anticipated that further lands will be added to Marble Canyon Park as a result of the Lillooet Land and Resource Management Plan (LRMP). Management directions set forth in this MDS will eventually be incorporated within a comprehensive park management plan that will include the original Marble Canyon Park, Pavilion Lake and all of the additional lands designated for Marble Canyon through follow up of the Lillooet LRMP.

Management Direction Statements describe protected area values, management issues and concerns and management directions focussed on priority objectives and strategies. While strategies may be identified in the MDS, the completion of all these strategies is subject to funding and funding procedures. In addition, all development associated with these strategies is subject to the BC Parks' Impact Assessment Policy.

Context

Pavilion Lake was added to Marble Canyon Park on April 18, 2001, through Order in Council designation under the *Park Act*. The park addition resulted from pressures from scientists and the Underwater Council of B.C. to establish strong measures to protect the unique and sensitive stromatolite features at Pavilion Lake. The boundaries of the park addition take in the lake bottom and foreshore of Pavilion Lake to the high water line, with the exception of 40 metre offsets along private land frontage, covering approximately 215 hectares. The whole of Marble Canyon Park, including the addition of Pavilion Lake, contains 550 hectares.

Pavilion Lake forms the westerly portion of Marble Canyon Provincial Park. The lake is 6 kilometres long and averages ½ kilometre in width. The clear blue waters of Pavilion Lake and imposing limestone walls of Marble Canyon above the lake present a spectacular visual setting.

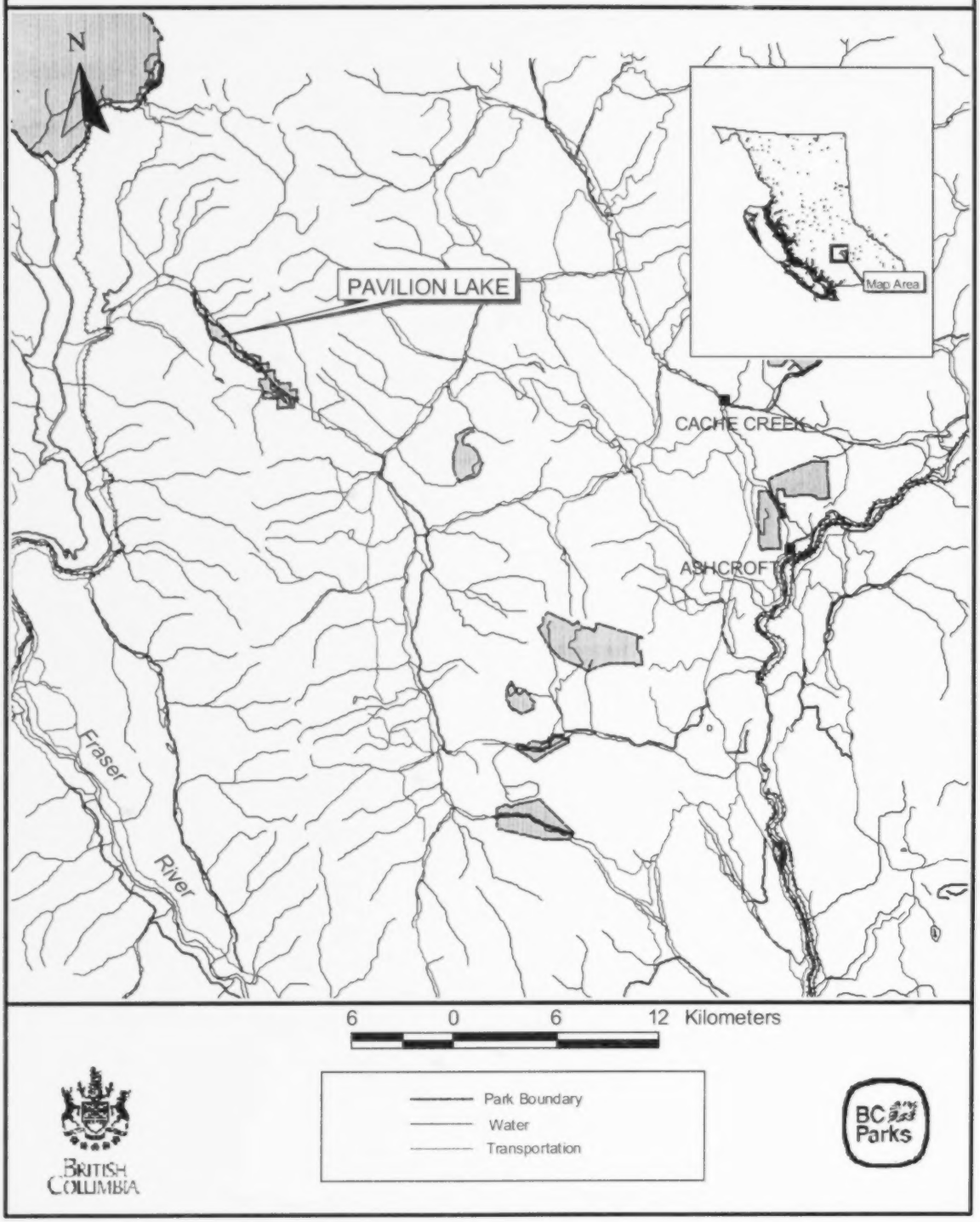
Protected Area Attributes

Conservation

- Globally significant stromatolite features:
  - Pavilion Lake is only one of a few places in the world where these stromatolite features can be found. Similar stromatolites to 1 - 2 cm have been found at nearby Kelly Lake, but there are no known freshwater stromatolites anywhere else that approach the large size as the ones found at Pavilion Lake. There are large stromotalites found in hypersaline conditions (Hamelin Pool – Australia) which form part of a World Heritage site.
  - These coral-like structures are formed from fossilized remains of micro-organisms (microbiolites) which are considered to be similar to some of the oldest known lifeforms on earth. Microbiolites are believed to have formed a critical stage in the evolution of life on earth. There is also scientific speculation that search for life on other planets such as Mars would focus on finding fossilized remains of similar organisms. Pavilion Lake provides an

Figure 1: Context

Pavilion Lake



unique opportunity for scientists to study and understand the biology of these modern analogs of early lifeforms.

- The structures range in size from small (1 cm) to large (3 meters). The larger structures are in various shapes from cones to mounds resembling artichokes. Many of the structures are soft and easily damaged while some of the older ones are fairly hard. Turret-like features occur on top of some of the big structures. Turrets are also found developing in various locations, particularly on the sloping shoals.
- The oldest and largest structures are estimated to have started forming 11,000 years ago, after the glaciers receded from the area. The structures are continuing to grow at extremely slow rates – some of them only 2.5 centimeters to three centimeters every thousand years.
- Most of the stromatolite features are extremely fragile.

Recreation and Tourism

- Pavilion Lake is known for its beautiful clear blue waters. The picturesque natural lake with backdrop of open forests to the south and massive limestone walls of Marble Canyon form an impressive setting for travelers of Highway 99. Highway 99 is a popular tourist route leading from Whistler and Pemberton through to Lillooet and into the interior of the province. The highway has been especially promoted as part of a circle route from the coast to the Rocky Mountains.
- The attractive setting led to early private alienation of most of the developable foreshore and upland for cottage and resort development. The lake is well used by property owners throughout the year, with the spring, summer and early-fall months having the most usage.
- High water clarity and interesting displays of stromatolites combined with the varied structure of the lake bottom creates an attractive destination for scuba divers. Most (90% +) diving occurs in the area around the island at about the mid-point along the north side of the lake and off of a small beach at the northeast corner of the lake. The island site provides the best opportunity for divers to access and view stromatolites (the largest occur in this area). The stromatolites at the beach site are small and require deep diving to 60 to 80 feet. The lake averages around 300 dives per year with the diving season generally running from the long weekend in May to October. Local divers use the lake as well as divers from Kamloops and the north Okanagan and there is some use from coastal divers. The lake is used by commercial dive shops for training and guiding purposes. There is an apparent recent increase in diving interest at the lake, which is likely the result of the publicity around the stromatolites.
- Pavilion Lake is annually stocked with rainbow trout. Fishing use is primarily by property owners and residents of local communities.
- Limited public access has basically limited boating use of the lake to cottage owners. Boating use is relatively light.
- Highway 99 parallels the north side of Pavilion Lake. Steep slopes have forced the highway to follow closely along the edge of much of the lake, with the result that there is little available area on Crown land for safe public access and use of the lake. The few points of access have very limited space for vehicle parking. As a consequence, scuba diving and swimming use from Crown land have been limited to day use access.
- A resort property (Sky Blue Resort) is situated on a prime location to provide the base and services for people to use the lake.

Cultural Heritage

- The Pavilion Indian Band holds special heritage and spiritual connection to Pavilion Lake and the surrounding land.

Significance in the Protected Areas System

- Conservation values related to the stromatolites are considered of global significance. Protection of the features formed the paramount reason for adding Pavilion Lake to Marble Canyon Park. The stromatolites are of international interest for scientific study and research.
- Pavilion Lake and the adjacent Marble Canyon form provincially significant visual features along a major tourism travel corridor.
- Pavilion Lake can be considered as one of the primary freshwater attractions for scuba diving in the province.
- Pavilion Lake is of regional significance for fishing, boating and other lake-oriented recreation activities. The lake is of critical importance to the enjoyment and experience of property owners.
- The lake and its environs are of special traditional and spiritual value to First Nations people.

Land Uses, Tenures and Interests

Access

The lake is situated 40 kilometres northwest of Cache Creek, about midway between Cache Creek and Lillooet on Highway 99. The lake has limited public access from a few points along Highway 99.

Tenures

- There are no known tenures or encumbrances within the park boundaries on the bottom of Pavilion Lake.
- Diamond "S" Ranch has two water storage licenses on the lake for 1,600 acre feet and 400 acre feet respectively, with conditions that water levels cannot be drawn down lower than natural drainage levels. The control structure (dam) is located outside of the park boundaries at the west end of the lake.

Existing Land Use Activities and Facilities

- The boundaries of Marble Canyon Park extend to include Pavilion Lake. Marble Canyon Park also includes Turquoise and Crown lakes and is developed with a small 26 unit campground and day use picnicking area. The park is used for transient day and overnight use and to some extent for destination camping and fishing. Campground use averages 9,000 people and day use (picnicking/rest stop) 90,000 people a year.

Adjacent Patterns of Land Use

- The park boundaries on Pavilion Lake were offset 40 meters out into the lake along the frontage of all private land parcels to prevent conflicts with existing private land uses. There are six areas of private land on the lake:
  - Private lot and cabins at the east end.
  - Sky Blue Water resort (developed with main lodge building, rustic cabins and camping area and adjacent private properties (developed with cottages). The resort is owned and operated by the Pavilion Indian Band.
  - The small island about midway along the north shore of the lake (small cabin).
  - Main subdivision development on large fan about 1/3rd of the way along the north side of the lake from its east end. The subdivision is developed with year round and seasonally used residences.

- Private lot about half way down the south side of the lake. This lot is access by water only and has little development.
- Ranchland at the west end of the lake is used for cattle grazing.

- Highway 99 and right-of-way parallel the north shore of the lake.
- BC Hydro power transmission line crosses upslope and parallel to the Highway.

First Nations Interests

- The Pavilion Indian Band holds special heritage and spiritual connection to Pavilion Lake and the surrounding land.
- The Pavilion Band has expressed concerns over possible resource developments in the surrounding area and to the potential impacts to water quality and the lake environment.
- Development and management of the park will require ongoing consultation with the Pavilion Indian Band to incorporate First Nations interests.

Other Agency Interests

The park will be managed in close co-ordination with various resource agencies, particularly for:

- lake levels management – Water Planning and Allocation Section (Ministry of Sustainable Resource Management)
- water quality management – Water Quality Section (Ministry of Sustainable Resource Management)
- fish management – Fish and Wildlife Science and Allocation Section (Ministry of Water, Air and Land Protection)

Private and Public Stakeholder Interests

- The Underwater Council of B.C. represents the provincial interests of the recreational diving community and has expressed three objectives relative to Pavilion Lake - **1**. Protection of the stromatolites; **2**. Allowing for continued scuba diving in Pavilion Lake; **3**. Developing strategies to minimize disturbance and damage of the stromatolites by scuba divers.
- Sky Blue Resort provides opportunities for scuba divers and other recreation users to access and use the lake. The Pavilion Band (owner of the resort) has expressed interest in co-operating with the Environmental Stewardship Division in the provision of recreation opportunities and access to the lake.
- Property owners are concerned with the maintenance of water quality and the natural environment of the lake.
- Commercial Diving – use of Pavilion Lake for training and underwater guiding.
- Local scuba divers – continued opportunity to use the lake.
- Recreationists (particularly boaters and fishermen) – continued opportunity to use the lake.

Protected Area Role Statement

The primary park role of Pavilion Lake is the protection of the stromatolites features and conservation of the lake environment. With protection of the stromatolites as the overriding and conditional precedence, park status will recognize and accommodate other interests and uses of Pavilion Lake including:

- The special spiritual, economic and life sustaining value and uses of Pavilion Lake for First Nations people.
- The underlying importance of maintaining the environment and water quality of Pavilion Lake for continued enjoyment and maintenance of the lifestyle of established residents.

- The significance of the stromatolites for scientific study and research.
- Continued public access and use of the lake for scuba diving, fishing, boating and other compatible recreational pursuits.

Management Commitments and Issues

Management Direction from Previous Planning

Pavilion Lake was added to the park before the completion of the Lillooet LRMP. The Lillooet LRMP table support, in principle, the park addition.

Management Issues

The following management issues have been identified:

Theme	Issue
Potential threats to stromatolites and lake environment.	• Lack of monitoring. • Potential damage that could occur through inadvertent disturbance from scuba diving. • Deep anchoring and the use of down riggers impacting stromatolites. • Littering of the lake bottom from ice fishing and other activities. • Potential invasion of coarse fish such as carp. • Potential infestation of milfoil and other underwater weeds. • Potential disturbance, damage and removal of specimens from scientific research projects.
Water quality	• Lack of water quality monitoring. • Lack of proper septic systems and potential contamination from in-flowing creeks and other sources. • Lack of proper sanitation facilities to accommodate general public use of the lake. • Highway construction (side casting) and maintenance (salting) may be impacting stromatolites and lake water quality. • Oil and gas contamination, particularly from vehicle use on ice. • Potential impacts of resource developments to the water and air quality at Pavilion Lake.
Diver safety	• Boaters are unaware of divers in the area.
Safe and secure public recreation use of Pavilion Lake.	• Lack of safe parking and access to the lake from the Highway. • Potential conflicts between user interests.

Management Direction

Priority Management Objectives and Strategies:

Objective	Strategy
To protect, maintain and improve water quality and the environment of Pavilion Lake.	• Work with other agencies (Water Management, Regional District) to establish baseline data and monitoring of water quality at Pavilion Lake. • Ensure that appropriate sanitation (toilets) is provided at key access points on the lake. • Ensure that access and use by the public is limited to day use only. • Work with other agencies (Forests, Regional District), Pavillion Lake Residents and Propery Owners Association, and residents and the Pavilion Indian Band to minimize impacts to water and air quality from residential subdivisions, upstream sources of contamination and potential pollution from nearby resource developments. • Prohibit lighting of fires on ice. Provide information on signs strongly encouraging people to not leave litter on the ice. • Encourage the diving community to remove any accumulated garbage from the bottom of the lake. • Work with Ministry of Transportation to prevent further sidecasting of material into the lake and to recommend use of environmentally safer alternatives to salt. • Monitor for invasive plants and animals and take appropriate action to control or eliminate invasions
To seek stewardship assistance in the management of Pavilion Lake.	• Establish close working relationship with the Underwater Council of B.C. The Environmental Stewardship Division anticipates that the Council will provide expertise and assist in putting forward recommended Best Diving Practices, information and messages for the website, brochures and signing and recommended monitoring methodologies. It is also hoped that the Council, through its members, will assist in monitoring, in getting information and messages out to the diving community and in enlisting the support of the diving community to respect the diving requirements at Pavilion Lake. • Support the endeavours of the Pavilion Band to provide access, facilities and services for diving and recreation use of the lake. • Work with the Pavilion Lake Residents and Property Owners Association, local residents, the Regional District and local divers in seeking co-operation and support for the management directions set forth in the management direction statement. • Encourage the Pavilion Lake Residents and Property Owners Association to establish a "Park Watch" program for the lake, adopting the basic principles of "observe, record and report". • Work with the scientific community in monitoring efforts and in developing further information on the stromatolites. • Maintain periodic and "as needed" consultation with Pavilion Lake

Objective	Strategy
	Residents and Property Owners Association, representatives of the local community and the Pavilion Band to review the state of park management and/or to bring forward management issues for advice.
To allow for non-destructive scientific study and research at Pavilion Lake.	• Encourage scientific studies that will provide more information and better understanding of the stromatolite features and associated lifeforms. • Ensure that all scientific related work does not create disturbance of the stromatolites. All work will be authorized through park use permit. • Work with the scientific community in developing interpretive information about the stromatolites. • Enlist the support of the scientific community in developing monitoring strategies and in conducting the monitoring.
To develop an effective communication plan for Pavilion Lake.	• Ensure that all information and promotion strategies are consistent with the role, zoning and management objectives for the park. • Work with the Underwater Council of B.C. and, in consultation with local divers, Pavilion Lake Residents and Property Owners Association, other residents and the Pavilion Band, develop appropriate public information for a park website, Best Practices brochure and signs. • Provide interpretation of the stromatolite features on the information shelter at Marble Canyon campground. This will be a longer-term initiative that will follow implementation of the Lillooet LRMP recommended addition to Marble Canyon Park.

Consultation and Future Planning

Planning and management of Pavilion Lake will conform to the intent and directions as set forth in the province's Protected Areas Strategy. The Environmental Stewardship Division is accountable for planning, administration and management of the park through application of the laws, policies and regulations granted under the *Park Act*.

This management direction statement has been reviewed and approved in principle by representatives of the Pavilion Lake Residents and Property Owners Association, other local residents, the Pavilion Band, the Underwater Council of B.C., the Squamish/Lillooet Regional District and users of Pavilion Lake. The role, objectives and strategies of this management direction statement for Pavilion Lake will eventually be incorporated into a management direction statement or management plan for the whole of Marble Canyon Park. The Environmental Stewardship Division will coordinate with other agencies, local public planning groups and First Nations in developing further management plans for Pavilion Lake and Marble Canyon Park.

Zoning Plan

The provincial park zoning system was developed for terrestrial environments, however, with adaptation of zoning guidelines, the **Natural Environment** and **Special Features** zones can be applied to Pavilion Lake. The zones capture the lake surface, water column and bottom environments. Distinguishing criteria for these two zones as they apply to Pavilion Lake include:

Criteria	Natural Environment	Special Features
Objective	To protect natural and recreation values in a largely undisturbed condition.	To protect significant natural features and processes because of their special character and fragility.
Use Levels	relatively low but may have some concentration at nodes of activity or points of access	generally low
Boundaries	set by limits of activity (scuba diving)	area defined by biophysical characteristics and the extent of the natural features
Recreation Opportunities	fishing, swimming, boating and scuba diving and other activities that do not pose a threat to the stomatolites; special requirements may be required for scuba diving; signage and interpretive facilities may be appropriate	fishing, boating and other activities that do not impact the bottom of the lake; but very limited opportunity for recreational scuba diving; special restrictions may be applied to prevent impacts to stromatolites (i.e.: restriction on down riggers),
Facilities	Signs and other facilities to direct underwater use.	no facilities
Impacts on environment	impact of human use is not normally visible, facility development limited to relatively small areas (points of access); facilities are compatible with the natural setting	none; resources to be maintained unimpaired
Management guidelines	oriented to maintaining a natural environment and a high quality recreation experience; visitor use may be managed to preserve the recreation experience and/or to limit environmental impacts; ongoing monitoring	high level of management protection with ongoing monitoring. Visitor use may be restricted to protect the stromatolites. Public information on the location of the stromatolites may be restricted.

The Park zoning plan delineates the zones as follows (refer to adjoining zoning plan map):

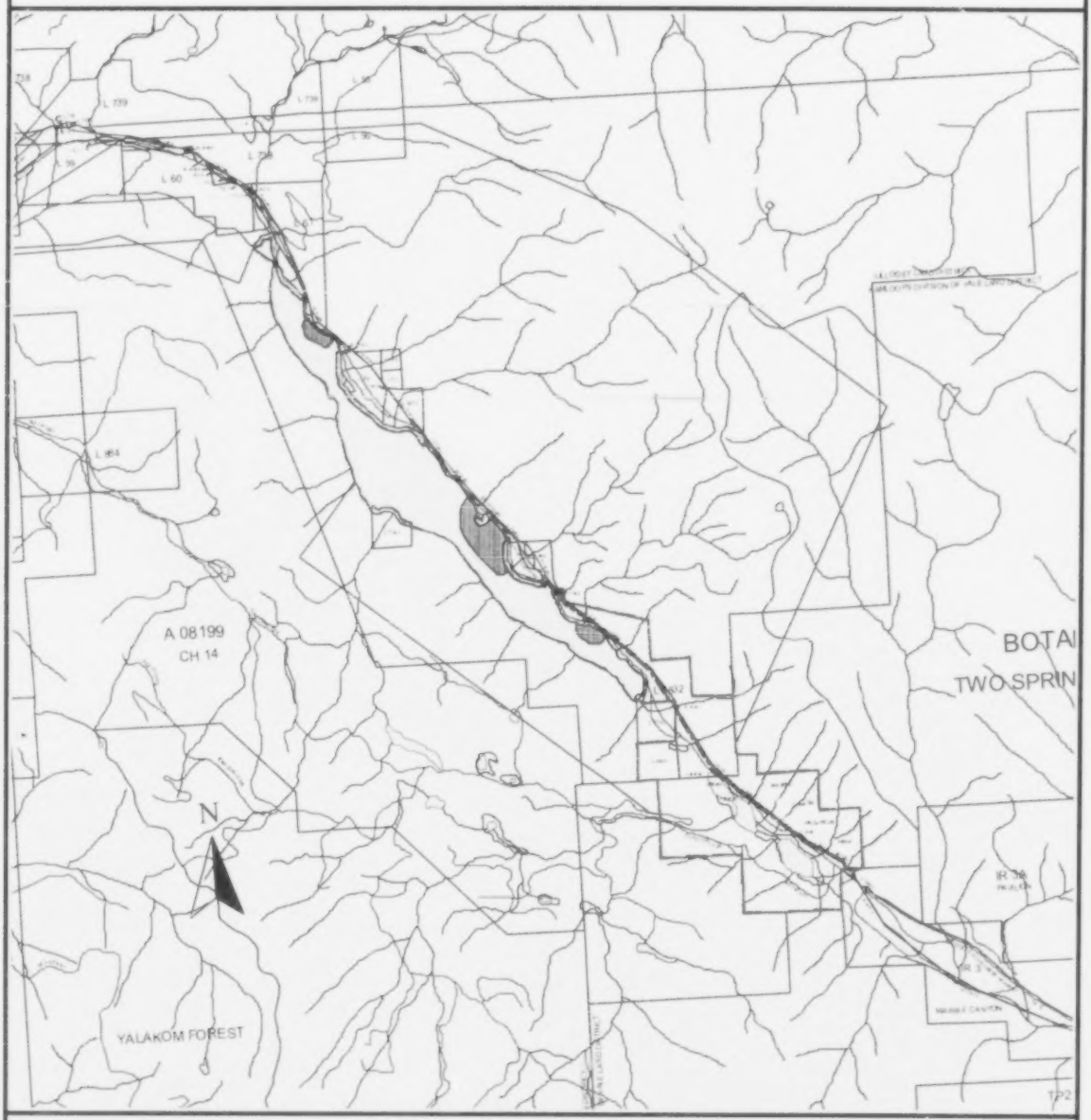
Natural Environment Zone:

1. Northeast site– extending to the 40 metre depth in a 150 metre radius from point of access.
2. Island to Sky Blue - From the westerly end of Sky Blue Resort out to the 40 metre depth, following the 40 metre depth contour to roughly the easterly end of Sky Blue Resort; thence in curved boundary through roughly the middle of the lake to connect past the island at the locally known "3 poles point" This site covers all of the area around the island and Sky Blue resort where most of the scuba diving activity occurs.
3. Northwest site - Along the wall off of the Highway on the northeast side of the lake down to the 40 metre contour.

Special Features Zone: To cover all of the remainder of the lake, including the area of primary interest for scientific study.

This Zoning Plan may be subject to review and refinement if required for management purposes. Relevant stakeholders, the Pavilion Lake Residents and Property Owners Association and other local residents will be consulted before any zoning changes occur.

Figure2: Park Zoning — Pavilion Lake



Appendix I - Table of Acceptable Activities, Uses and Facilities– Pavilion Lake

The following table provides a summary of acceptable uses, activities and facilities within the park boundaries.

Activity/Use/Facility	Acceptability
Aboriginal traditional uses and activities	Y
Fishing	Y
Recreational Rock Hounding/ collection of stromatolites	N
Guide Outfitting (fishing)	Y
Water Control Structures/water lines	N2
Private wharves and other surface and sub surface structures	N
Fish Stocking and Enhancement	N1
Use of down riggers	N
Road Access	Y
Motorized Water Access (anchoring may be managed to prevent damage to stromtatolites)	Y
Snowmobile access and use	Y
Winter ATV access and use	Y
Aircraft Access	N2
Noxious Weed Control	Y
Exotic Species Control	Y
Scientific Research (non-destructive)	Y
Scientific Research (specimen collection)	M
Scientific Research (manipulative activities)	M

Y= allowed subject to conditions identified in the management direction statement or management plan
M= may be permitted if compatible with protected area objectives
N= not allowed
N1= allowed for expressed management purposes only
N2= present and allowed to continue but not normally allowed